

## **Central extensions of Lie algebras, dynamical systems, and symplectic nilmanifolds**

Iskander Taimanov

*Sobolev Institute of Mathematics, Novosibirsk*

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The connections between Euler's equations on central extensions of Lie algebras and Euler's equations on the original, extended algebras are described. A special infinite sequence of central extensions of nilpotent Lie algebras constructed from the Lie algebra of formal vector fields on the line is considered, and the orbits of coadjoint representations for these algebras are described. By using the compact nilmanifolds constructed from these algebras by I.K. Babenko and the author, it is shown that covering Lie groups for symplectic nilmanifolds can have any rank as solvable Lie groups.